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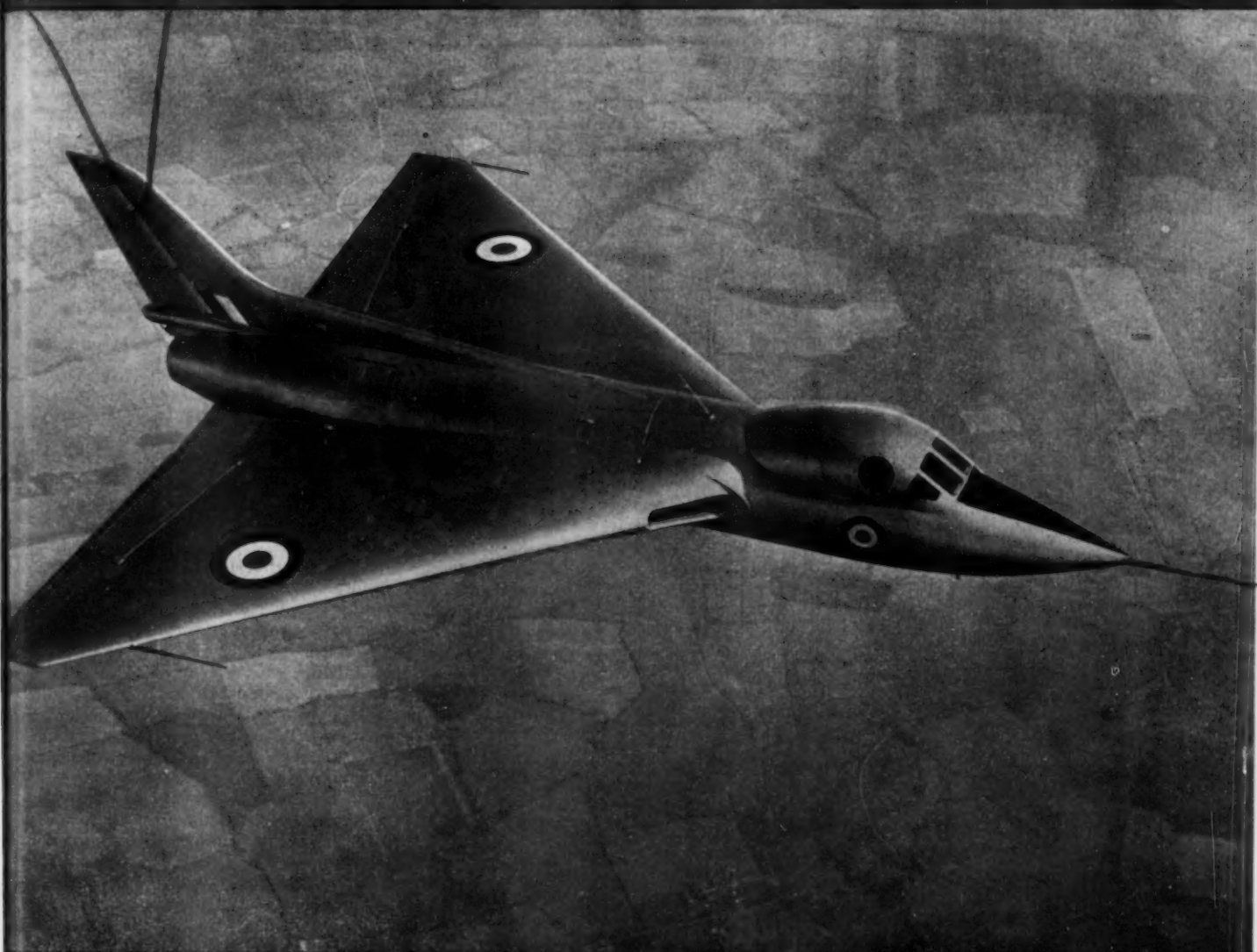
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August 8, 1953

VOL. 64, NO. 6 PAGES 81-96

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Delta-Wing Trainer

See Page 87

A SCIENCE SERVICE PUBLICATION

PSYCHOLOGY

Peace Parley Success

To gain peace, the objective of the talks, U. S. delegates should thoroughly understand the psychology of conference, of agreement, and of compromise.

► **WAR ON** Heartbreak Ridge and the other battlefields of Korea is over, it is hoped. However, from around the conference tables, not on any battlefield, will come the determination of whether the world is to have a real peace or a world war with its tragic destruction.

No chief of staff of a major world power would think of going into battle today armed only with bow and arrow, or even rifles. He wants the best in modern weapons, even if it is decided not to make use of the atom bomb.

Those entering the peace conference rooms, where the outcome is even more vital to survival, should be adequately armed to insure satisfactory results of the deliberations.

Here, however, the armament must be psychological, not military. And it must be designed to produce good will and co-operation, not humiliation or defeat.

The only way to reduce the frictions at such meetings, the frequent and protracted walk-outs, the bitter invective, the hatching of situations from which there can be no amicable escape, is by greater understanding of the psychology of conference, of agreement, and of compromise.

Naturally, at any such meeting there are conflicting interests. Otherwise there would be no need for the meeting. The purpose of the meeting is usually, or at least it should be, to arrive at some sort of compromise that will be the closest approximation of the interests of all those taking part or the majority of them.

This inevitably involves some sacrifices of

the interest of each nation for the sake of the common interests of all.

Yet it is the almost universal custom to select as delegates to the meeting persons who are psychologically unsuited to any kind of compromise. To represent us at the council table, we select a good fighter, not a peacemaker. We pick a "tough negotiator." And we expect him to drive a hard bargain, to use a show of force or implications of threats instead of sincere concern with the problems of others in his attempts to contribute toward the group decisions.

If he is not a hard-hitter, a tough talker, a shrewd bargainer the public tends to be dissatisfied with him as a representative. This is doubtless true in Russia and in China as in America.

What is needed at the conference table is more sound psychological advice. We need greater understanding of the people we are meeting with, not just the language they speak, but their deeper motives, their aspirations and urgent needs.

We need to understand their symbols and figures of speech. Otherwise what seems to one nation a symbol of peace may present to others a flagrant flaunting of a strange ideology. And what is meant as conciliation may produce only anger.

Even traditions of parliamentary practice differ in different parts of the world. Some representatives might be offended by such seemingly inoffensive rules as those putting limits on time for discussion because they are contrary to their own customs although common with us.

Science News Letter, August 8, 1953

GENERAL SCIENCE

Free Scientific Inquiry

► **TOO MUCH** designing and control of research and too little freedom for scientists to do what they want to do are likely to ruin the chances of new discoveries in the future.

This is what Dr. Curt P. Richter, Johns Hopkins psychobiologist, argued in a committee of the National Research Council a few months ago. Now *Science* (July 24) has presented his plea for free research instead of design research.

There are too many committees that have the say-so on whether investigations are financially supported largely today by government funds. Dr. Richter finds that projects suffer "passing the buck" from committee to committee, because no one

takes time to find the facts or because fellow scientists are not willing to bet on a man who has an idea.

Team research or investigations by groups, designed or planned in great detail, may be effective in getting things done when discoveries already made are applied for war or industry.

But Dr. Richter finds that in the past great discoveries have with a few exceptions been made by individual workers, often working in great isolation. Some of the most important discoveries have been made without any plan of research, largely by accident or in dreams.

Discoveries have resulted from a state of mind that cannot be put in words and can

be called puzzlement at discrepancies in findings. Some of the best researchers do not know what they have been after until they actually arrive at their discoveries. Their thinking functions in terms of experiences and subconscious observations.

For better research Dr. Richter recommends: Less paper work and fewer reports. Few strings attached to research grants. Long periods of financial support. Fewer conferences and more time for experimentation and thinking.

Science News Letter, August 8, 1953

ANIMAL NUTRITION

Pup Growth Sparked With Amino Acids

► **PUPS WILL** grow and be as frisky on a low-protein diet as with a higher protein ration, if you add a bit of two amino acids, raw materials for protein, to their meals.

A 12% protein diet, supplemented with lysine and methionine, led to normal dog growth equal to that on a 20% protein diet, Drs. E. S. Robajdek and P. H. Phillips of the University of Wisconsin's Agricultural Experiment Station, Madison, have found.

Lysine alone with the low-protein diet allowed normal growth, but the addition of methionine made for more efficient use of the protein.

Science News Letter, August 8, 1953

PSYCHOLOGY

Don't Ask Man's Wife What He's Really Like

► **WHAT IS** a man really like?

"Don't ask his wife," advises Dr. Verne Kallejian, clinical psychologist at the Institute of Industrial Relations, University of California at Los Angeles, who is making a study of the factors involved in peoples' understanding of one another.

"We tend to believe that we understand best those people we like the most and feel that they are similar to us," he said. "In reality, great difficulty in understanding occurs with those whom we strongly like. We tend to see them as we want or expect them to be rather than the way they actually are. The same difficulty occurs with those we dislike since we tend to see in them characteristics which we dislike in ourselves."

Two other factors which interfere with the development of understanding are personal tension and the use of stereotype. When people are tense they tend to be less alert to what is happening around them. Since no one person ever conforms to a given stereotype, understanding based upon them is likely to be faulty.

These conclusions were drawn from an analysis of tests administered to 98 leaders in business, education and community groups before and after their participation in a group leadership training program sponsored by the University.

Science News Letter, August 8, 1953

BIOCHEMISTRY

'Flu and Polio Weapon

Glucuronic acid, the product of burned, or oxidized, glucose, is discovered to be a possible defense medicine against virus infections, which include 'flu and polio.

► HOPE THAT a chemical from sugar may provide a defense against disease viruses, from 'flu to polio, is held by scientists at Yale University School of Medicine, New Haven, Conn.

The chemical is a product of glucose when it has been burned, or oxidized, in the body. It is called glucuronic acid. It is also made synthetically and is relatively inexpensive. It is known to detoxify certain poisons in the body.

"There is a chance, but no more than a chance" that it could be used to protect humans against virus diseases such as polio and influenza, Dr. J. F. McCrea, one of the scientists who has been working on the problem, states.

The work so far, which he and Dr. F. Duran-Reynals report in *Science* (July 24), has been limited to laboratory animals and to vaccinia virus (the cowpox virus used to vaccinate against smallpox) and influenza virus.

In mice there is "definite evidence" of prevention of influenza infection when these animals get 'flu virus treated with glucuronic acid dropped into their noses. Most control mice in the experiment who got untreated influenza virus into their noses died within two or three days with almost completely congested lungs as a result of the virus. The mice who got the treated virus almost all survived.

Whether glucuronic acid will stop polio viruses is not known yet. Work on that is scheduled to start in September.

Unanswered also, so far, is whether the acid will be as effective in humans as in the laboratory mice. For human use, if that becomes a reality, it could be used in one of two ways: 1. Mixed with the virus to produce a good vaccine. 2. Given directly by mouth or by injection as penicillin or other antibiotics are given.

For practical purposes it seems likely now it would be given directly. Vaccines take time to become effective after being given, whereas glucuronic acid might take effect immediately. Even if its effect were only temporary, as is probable, it might serve to ward off a 'flu, polio or other disease attack when given in the midst of an epidemic. Vaccines usually must be given before the epidemic gets very far under way.

Discovery of glucuronic acid as a possible, though only possible, defense medicine against virus infection comes from earlier studies by Dr. Duran-Reynals (see SNL, Jan. 19, 1952, p. 39). He found that cowpox virus could be inactivated by a body chemical called hyaluronic acid. This chemical is a component of the jelly-like mass

which holds tissues together which scientists term the ground substance.

The virus-inactivating effect of hyaluronic acid, he found, was markedly increased when this acid was treated with an enzyme chemical, hyaluronidase. The studies reported show that this is because treating the acid with enzyme releases glucuronic acid.

Science News Letter, August 8, 1953

MARINE BIOLOGY

Sea Urchins Burrow Through Steel Pilings

► SOLID STEEL is hardly a challenge to the purple sea urchin, one of the sharp-spined "porcupines of the sea," when it decides to dig a burrow.

Twenty out of 40 steel pilings of a pier near Ellwood, Calif., were put out of commission when purple sea urchins, *Strongylocentrotus purpuratus*, bored holes through steel plates three-eighths inch thick.

Sea urchins attach themselves to rock, coral, and cement, wood and metal pilings, where they pass sedentary life. They exert

a corrosive action on their supports, to make depressions where they can stay well protected.

Most people are delighted that the prickly sea urchins are inclined to keep out of the way, since the spines of some species are extremely poisonous. But when they bore into expensive pier pilings, their retiring nature causes them to rank with barnacles, teredo worms and other such "public enemies" of marine construction.

Science News Letter, August 8, 1953

MEDICINE

Fight Death by Relieving Fear

► SAVING LIVES of expectant mothers by banishing their fears of childbirth is the aim of a new program, first of its kind in the southeast, launched by Duke University, Durham, N. C.

Hemorrhage, toxemia and infection, in that order, are the leading causes of death in childbirth. However, in many cases, these causes could be prevented or overcome if the expectant mother started seeing a doctor early enough in the course of her pregnancy.

Fear, often based on old wives' tales, keeps many of these mothers from seeing a doctor or going to a hospital until too late. The Duke program, under the direction of Dr. John Ashe, will try to overcome this fear through public lectures, movies and demonstrations.

Science News Letter, August 8, 1953



LION-HEADED MARMOSETS—Found in southeast Brazil, these marmosets have extremely long hands, believed to have evolved because of their eating habits, since their food consists mostly of fruits and insects. The animals shown here are part of a colony in the National Zoological Park in Washington.

CHEMISTRY

Domestic Aluminum Source

Hope of continuous, production-line separation of aluminum from domestic clay seen in operation of experimental alumina plant by the Bureau of Mines.

► PROGRESS TOWARD securing a domestic source of aluminum metal is seen by officials of the U. S. Bureau of Mines as the result of eight weeks of operation of the experimental alumina plant at Laramie, Wyo.

Hope is for a continuous production line that will extract from common clay the equivalent of imported bauxite, the only practical aluminum ore.

Recovery of aluminum metal from clay is not the problem of working low-grade ore. There is plenty of aluminum everywhere underfoot. The difficulty of getting it out is the technical one of separating the aluminum from the silica with which it is combined.

Two main ways of making this separation have been explored in recent years, especially during World War II when enemy submarine activity made importation of bauxite hazardous. Either an acid or a combination of lime and soda can be used for chemical attack on the clay.

Although opposite in chemical properties, either process has for its goal separation of aluminum compounds from silica. The aluminum is wanted in a form that can be handled by present equipment designed for bauxite.

Clay is heated with lime and soda in the Laramie plant in such a way that the lime

holds back most of the silica while the aluminum dissolves with the soda. After this separation, treatments with more lime, followed by carbon dioxide, remove more silica, and the remaining solution comes nearer to the quality of aluminum ore desired.

One trouble with any silica compound is the thick, gelatinous nature of the solution that may have to be dealt with. The Laramie plant meets this difficulty by putting in molasses which, surprisingly, delays the formation of the silica gel.

This step is considered a temporary stop-gap by Bureau of Mines officials. Better ways of handling the clay compounds are expected to be worked out soon, as the new process becomes more streamlined.

Other processes worked on experimentally during World War II by both government and industrial laboratories used sulfuric or hydrochloric acids to extract aluminum from clay. Better separation from silica is accomplished by acid processes, but corrosion of vats, pumps and pipes that handle the acid solutions presents a more serious problem.

Clay treated by the lime-soda process as used at Laramie is more like the material now in common use in making aluminum metal from bauxite.

Science News Letter, August 8, 1953

For comparison the investigators allowed the image to shift with eye movements in the ordinary way. This was done by reflecting the image from the projector on a mirror mounted on a rigid support near the eye. They also doubled the ordinary amount of movement by the use of prisms.

With normal movement of the image on the retina, fine lines did fade, but they reappeared from time to time. Heavy lines remained steady.

With the movement of the image exaggerated by prisms, there was almost no disappearance of even the finest lines.

Science News Letter, August 8, 1953

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PSYCHOLOGY

Disappears at Steady Stare

► MAYBE THE Cheshire Cat in Alice in Wonderland disappeared because Alice stared at it too steadily.

Try staring steadily at a single letter on this page. You may not realize it, but you can't hold your eyes completely still. You may do pretty well for the first second or two, but even then a tiny tremor keeps your eyes in constant, though small, motion. After the first second or two, your eyes start to drift away so that the image of the letter falls on different cells of your eye's retina.

It is this involuntary movement of the eye that enables you to keep on seeing the letter. If it were possible for you to keep your eyes completely still, the letter you are looking at would "wash out" and disappear like the Cheshire cat until even the grin (in this case, the white paper) is gone, too.

How objects disappear under a steady gaze was discovered in experiments at the Psychological Laboratory of Brown Univer-

sity, Providence, R. I. The results were reported to the *Journal of the Optical Society of America* (June) by Prof. Lorin A. Riggs, Dr. Floyd Ratliff, Janet C. Cornsweet and Tom N. Cornsweet.

These investigators devised an ingenious method of keeping an image in exactly the same place on the eye's retina. A tiny mirror was mounted in a contact lens placed over the eye of the observer. Then rays from a projector were shone on the mirror, reflected on to a screen where it was seen by the observer. With every tiny movement of the eye, the mirror moved too. And so did the image on the screen.

At first the observers were surprised at how bright and steady the image looked. But soon it disappeared. A fine black line disappeared in the first few seconds. Heavier lines took longer to vanish and then would reappear from time to time for a minute in true Alice-in-Wonderland fashion.

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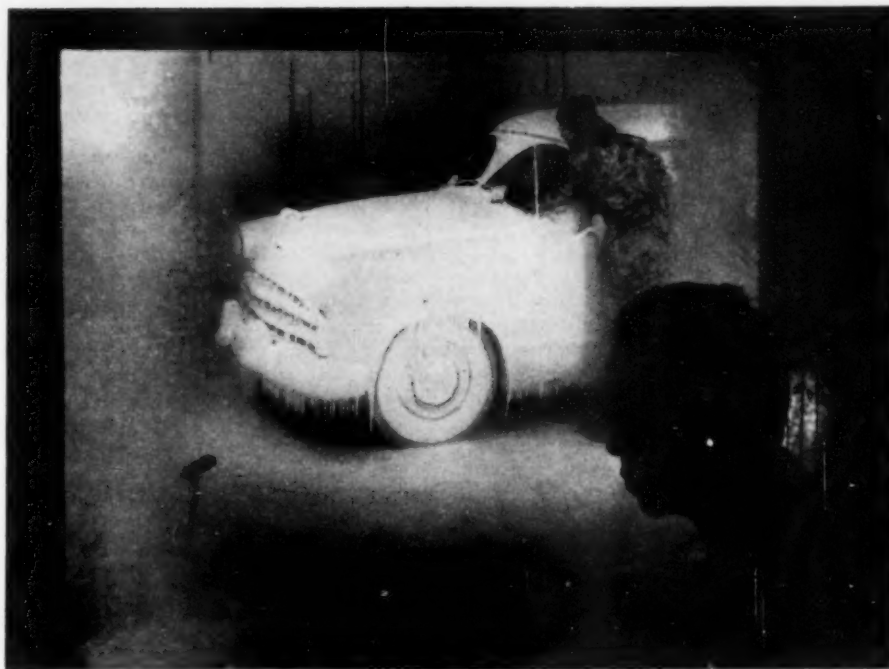
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JANUARY IN AUGUST—A technician at a Chrysler Corporation plant watches as a colleague cold tests an automobile under simulated extreme winter conditions. The engineers must wear special cold weather clothing to work in the temperatures as low as 40 degrees below zero Fahrenheit.

ENGINEERING

Hints on Cooling Houses

New booklet gives methods for keeping houses cool in the summer without air-conditioning. Suggestions include use of light-colored venetian blinds outside of house.

► **YOU CAN** do a lot to keep your house cool in the summer without buying air-conditioning equipment.

The Small Homes Council at the University of Illinois advises that sunlight should be prevented from beating down on house walls and windows where possible. Trees, overhangs, window louvers or blinds, awnings, louver-type insect screens and light-colored walls all can help offset the onslaught of a blistering summer sun.

The Council reports that light-colored venetian blinds used outside the house are 70% effective in reducing heat load, but are only 40% effective inside the house. Similarly, a fully drawn, light-colored roller shade is 55% effective in reducing heat load, but a dark shade is only 20% effective.

Since light colors reflect heat, it also is desirable to have a light-colored roof.

Ceilings should be well insulated to prevent heat from getting into the house. The space under the roof should be well ventilated so hot air can escape. Forced-draft ventilating fans can be used to pull cool night air into the house. This gives better results than opening windows and doors.

In an eight-page free circular of its findings, the Council reports air-conditioning equipment can be installed when other methods do not produce the desired summer comfort. Some air-conditioning equipment combines with warm-air or hot-water heat circulation systems, and some machines are complete in themselves. (See p. 92.)

Other points listed in the booklet include: orienting new houses so that major walls and windows get a minimum of strong sunlight, and proper placement of windows and doors to fully use natural breezes.

Simple illustrations and charts show how shadows of overhangs can be calculated for different latitudes, how to select draft fans for houses of different floor space, how roofs and walls should be ventilated and how to select the proper cooling capacity of air-conditioning equipment.

Prepared by S. F. Gilman, W. S. Harris, S. Konzo, R. W. Roose, W. F. Stoecker, R. A. Jones and James T. Lendrum, the circular "Summer Comfort" can be obtained from the Small Homes Council, Mumford House, University of Illinois.

Science News Letter, August 8, 1953

PUBLIC HEALTH

Scientists Declare War on Air Pollution

► **SCIENTISTS HAVE** declared war on air pollution. At least 37 research institutions in the United States and Canada now are looking into various aspects of the problem, the American Society of Mechanical Engineers reports.

Air pollution has been so severe at times that it actually has killed people. The Donora, Pa., smog of October 1948 claimed 20 lives. Prolonged and intense fogs in Europe and London last winter ran up a death toll exceeding 4,000.

In its first report on who is doing what in air pollution, the ASME lists 37 organizations and the nature of work being conducted by them. Among these are:

U.S. Atomic Energy Commission — Studies on radioactive dust from nuclear detonations.

Princeton University—Effect of loss of sunlight on human health.

University of Cincinnati—Establishment of character and source of air pollution; development of analytical methods; health effects on animals and man.

Ontario Research Foundation—Measurements of dustfall; atmospheric dust, gas and vapor concentrations; meteorological studies, and determination of "corrosion potential."

The Johns Hopkins University—Chronic exposures to air pollutants and acute infections; performance of institutional incinerators and disposal of radioactive wastes.

California Institute of Technology—Analysis of Los Angeles smog for organic pollutants and their transformation products.

University of Illinois—Causes of smog in Los Angeles and other cities.

Science News Letter, August 8, 1953

INVENTION

Sparkling Machine Chases Birds From Buildings

► **PIGEONS, STARLINGS** and other birds that like to roost in places that annoy city dwellers may get the shock of their lives some day when they find their favorite haunts no longer tenable.

John H. Just of Syracuse, N. Y., has received a patent on his "apparatus for controlling bird nuisance." Installed where birds congregate, it throws sparks at the fowl.

Three wires are strung along building ledges. Two of the wires are connected to ground, the third is fed by a high-voltage generator. When a bird disturbs the field of the high-voltage wire, a spark shoots out and crackles through the bird's feathers so as to "permanently discourage and frighten it away from the gathering place or roost." The spark will not hurt the bird, but it will ruffle his dignity.

Inventor Just assigned rights on his patent, No. 2,647,228, to Eli Gingold, also of Syracuse.

Science News Letter, August 8, 1953

ASTRONOMY

Perseid Meteors Flash Now

Any clear night just now will give good seeing for "shooting stars," the light flashes produced high in the atmosphere by flying "gravel banks."

By ANN EWING

► ANY CLEAR night now or for the next week or so will be good for seeing "shooting stars."

Billions of tiny particles of cosmic dust daily bombard the earth's atmosphere, and many of them flash into our view as brief streaks of light, or shooting stars, then disappear.

The number of these meteor trails visible—about one per minute—is greater during the Perseid shower in August than at any other time of the year. However, some random, or sporadic meteors can be seen any clear night.

Astronomers have found that, although the reason is not yet clear, about twice as many meteors can be seen during the last six months of the year as during the January-June period.

One of the best and most reliable of the shooting star shows is the Perseid shower, which reaches its height Aug. 12. An unusually large number of meteors can be seen, however, any time this week or next. The Perseid shower is so named because the meteors appear to originate in the constellation of Perseus.

Actually they are moving in parallel paths, one of the many separate swarms of flying "gravel banks" that swing around the sun in definite orbits. Due to perspective, they seem to radiate from the constellation, just as parallel railway tracks seem to run closer together in the distance.

Best Seen in Early Morning

The best time for viewing a meteor's brief flame is in the early morning hours, because at that time we are on the forward side of the earth. The earth thus sweeps through the meteors at a high speed. In the evening, we are on the back side of the earth, and see only the fast meteors, the ones that overtake the earth and enter its atmosphere at a comparatively low speed.

Sometimes the moon is so bright that its light makes it difficult to spot meteor showers. This year, however, the moon will be new on Aug. 9, and it sets early in the evening, so it will not interfere with the spectacular display of shooting stars.

A meteor gives no warning of its dash into our atmosphere—where it came from and what it is made of must be discovered in the very brief time it can be spied on, either visually or by radar. Therefore, amateurs, working according to pre-arranged programs, are of great help to professional

astronomers, whose study of meteors is furnishing new information on the temperature and density of our atmospheric shell 35 to 60 miles out in space. In effect, these bullets from space furnish the government with high-velocity projectiles for atmospheric studies that do not cost a penny.

Even without a program, an amateur can, with luck, get a picture of a meteor. Place the camera in a fixed position and aim it low in the northeast at Perseus, just below Cassiopeia.

Use a fast, blue-sensitive film. With an f4 focal ratio, a two-hour exposure is needed; with f2.5, one hour; and with f1, ten minutes should be sufficient. Try off and on all night to get a photograph.

The stars, instead of appearing as bright dots, will show up as curved trails on the film. If you do snap a meteor, it will show up as a long straight line, probably cutting across the paths taken by the stars.

The Super-Schmidt cameras, operated by Harvard College Observatory near Los Cruces, N. Mex., are fast, wide-eyed cameras designed especially for meteor hunting. Yet when there is no special meteor shower, such as the Perseids, they catch only one

flash every half hour. This, however, is still a great improvement over the average prior to operation of the Super-Schmidt; then it was only about one for every 100 hours of observing time.

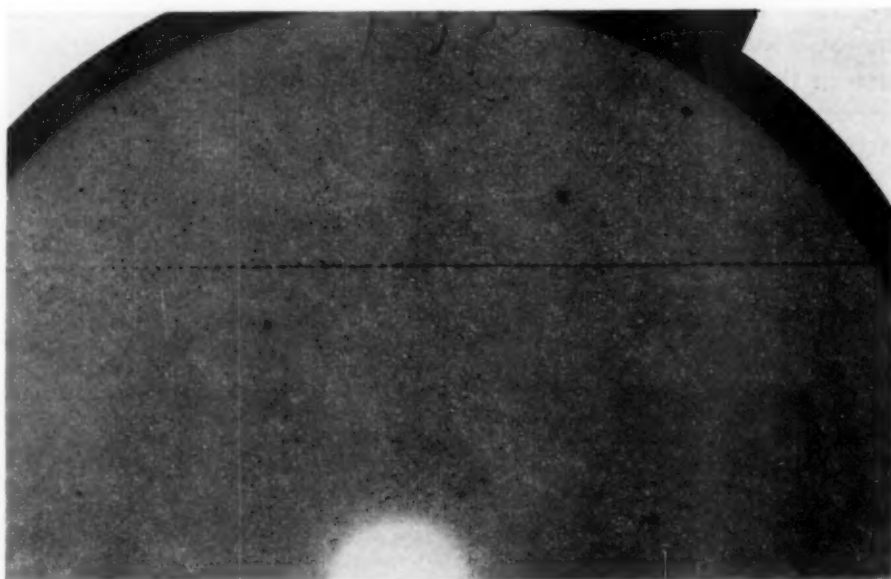
Studies with these new cameras confirm what the first systematic photographic survey of meteors, started over 20 years ago, and the more recent radar studies have shown—that most of the meteor showers belong to the solar system.

The speeds at which the meteors flash into our atmosphere are the clues to their origin, and these speeds can be accurately plotted when the meteor's photographic path is regularly broken by a whirling shutter.

Speed Can Be Calculated

The periodic breaks made many times a second in photographs of a meteor's trail reveal the slowing down of the meteor due to the resistance of the upper air, from which its speed before hitting our atmosphere can be calculated.

None of the speeds for the shower-connected meteors are fast enough to indicate that they came from beyond our own solar system. In fact, many astronomers today believe that probably all meteors, both shower-connected and sporadic, originate in the solar system.



SPEED-REVEALING TRAIL—The deceleration of a meteor due to resistance of the upper air is revealed by the periodic breaks made in a meteor trail by a rotating shutter on the camera. This meteor trail, flashing from left to right, was photographed with the Baker Super-Schmidt by Samuel Whidden at Soledad, N. Mex., for the Harvard Meteor Project, directed by Dr. Fred L. Whipple for the Office of Naval Research and the Air Force. The shutter breaks are 60 times a second.

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All known meteor showers are related to comets. Tuttle's comet, last seen in 1862, is the parent of the millions of particles of cosmic dust that the earth meets in August. They broke from the comet some 40,000 years ago, Drs. Fred L. Whipple and Salah El-Din Hamid of Harvard College Observatory have computed.

Most astronomers believe that at first meteor particles are close to or part of the parent comet. The cosmic dust then gradually strays behind or ahead of the comet, but keeps pretty close to the same path. Over a long period of time the particles become evenly distributed around the orbit, as is the case with the Perseids.

Thousand Year-Old Showers

Past records show that the Leonid shower has been seen in October or November for over 1,000 years, and the Lyrids have been spotted in April for over 2,500 years. The associated comets, 1866-I and 1861-II, were not, however, observed until the nineteenth century.

Especially bright meteors, those emitting sufficient light to cast shadows, are called fireballs. The few meteors that enter our atmosphere and penetrate to the ground are known as meteorites. Meteorites that have been spotted and picked up immediately after falling have not yet been identified with a meteor shower, and probably are from sporadic meteors.

As the tiny meteor particle rushes into the earth's atmosphere, it collides with air molecules. The impact is very violent because of the particle's great speed, and the atoms on the surface of the pin-head-sized particle are vaporized and spread out. These atoms, in turn, collide violently with other air molecules, mostly not in the direct path of the meteor itself.

These collisions break off electrons from the air molecules and the meteor atoms. They also make the meteor atoms luminous. Thus the meteor creates around itself a luminous cloud of its own atoms. It is this cloud we see as the shooting star. The meteor's atomic cloud is continually blown away and is being constantly renewed, until the original material is entirely used up, or, if the entering material is sufficient, until it falls to the ground as a meteorite.

Radar Spots Meteor's Trail

As the meteor with its atomic cloud moves on, it leaves behind a long trail of ions and electrons. The trail, originally less than an inch in diameter, may be rapidly disturbed by the high winds of the upper atmosphere, much like the trails left by jets are blown about lower in the atmosphere.

These ionization trails, though not visible, can be spotted by radar beams, since for a brief time they reflect radio waves back to their source just as a plane or ship does, providing the radio waves meet the trail at right angles.

Radio waves spot these trails regardless

of weather, and regardless of whether it is day or night. The narrow radio beams are much more sensitive than the eye and they can detect meteors much fainter than the eye can see. They have thus opened up a whole new field of meteor study, and led to the discovery of some daytime-only meteor showers that had previously gone undetected.

The spectroscope can spread out the meteor's light into a band that reveals what kinds of atoms or molecules are emitting its light. Since the meteor's passage is both brief and unexpected, these spectrograms are hard to get.

Dr. P. M. Millman of Ottawa, however, has succeeded in catching them. These spectrograms show that meteoric light is emitted by metallic atoms, especially atoms of iron, calcium, magnesium, manganese, chromium, aluminum, nickel and sodium.

Science News Letter, August 8, 1953

MATHEMATICS

Suggest Einstein Solution

► THE BASIS of the universe, including both matter and gravitation, is electromagnetism, Prof. Vaclav Hlavaty of Indiana University believes.

He has found mathematical proof that, if Einstein's new unified field theory is valid, an electromagnetic field is required for a universe which contains matter, and hence, gravitation.

Einstein's unified field theory attempts to explain the workings of the universe in one

AERONAUTICS

First Delta-Wing Trainer Makes Its Initial Flight

See Front Cover

► THE WORLD'S first delta-wing trainer has made its initial flight, the British government has revealed. The plane is a dual control version of the delta-wing research craft, and is designed to familiarize pilots with this type of aircraft.

It is expected that the Avro 707C trainer, shown on the cover of this week's SCIENCE NEWS LETTER, will make its first appearance at the Society of British Aircraft Constructors' display later this year. The trainer is powered by a Rolls Royce "Derwent" turbojet engine.

Science News Letter, August 8, 1953

set of laws. He proposed certain formulas to link all known physical phenomena, but did not attempt to solve his equations.

Prof. Hlavaty believes that it will now be possible to devise experiments to test the validity of Einstein's field theory. His solution, he says, reveals the route by which the conflict on what law or laws govern the universe can be resolved.

Because of its great success in predicting atomic behavior, most physicists today favor the quantum theory. This pictures the universe as made of discrete bundles, or quanta, of energy, the size of each such packet being proportional to the frequency of the radiation. Energy can thus vary only in multiples of this elementary quantum.

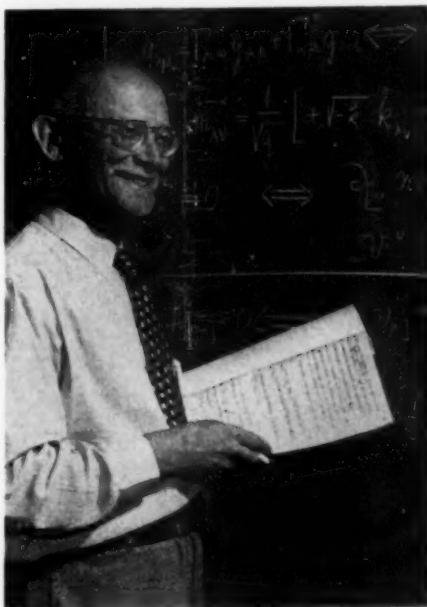
Because these quanta are so tiny, they can be dealt with only on the basis of large groups at one time. Such use of the statistics of chance in dealing with nature prompted Einstein's remark, "I cannot believe that God plays dice with the cosmos!"

The unified field theory pictures the universe as continuous and well-ordered, with equations of a single theory giving a complete description of gravitational, electrical and nuclear forces.

Prof. Hlavaty's solution of Einstein's theory shows that gravity is just another facet of electromagnetism; that it is electromagnetism that gives rise to matter and thus to gravity. He makes use of spinors, a mathematical tool also used in quantum mechanics, in arriving at his solution. Therefore, Prof. Hlavaty believes, the spinor theory will be the first arch of a possible bridge between the unified field and quantum concepts.

Prof. Hlavaty, a refugee from Communist Czechoslovakia, is an expert in the field of multi-dimensional geometry. He is a member of the Indiana University's Graduate Institute of Applied Mathematics.

Science News Letter, August 8, 1953



PROF. VACLAV HLAVATY—
Shown on the blackboard is a portion of the equations used by Prof. Hlavaty to obtain solutions to formulas of Einstein's unified field theory.

MEDICINE

New Virus Causes Polio-Like Disease

► **DISCOVERY** OF a new virus which apparently can cause a polio-like disease in humans is announced by Drs. Alex J. Steigman, U. Pentti Kokko and Rosalie J. Silverberg of the Kentucky Child Health Foundation Research Laboratory and the University of Louisville School of Medicine.

It is called, tentatively, Mack virus, because Mack is the last name of the little girl from whom it came. Back in 1947 this little girl, then five years old, got sick during a polio outbreak in Cincinnati. She had headache, pain, stiffness of the neck, temperature of 103 degrees Fahrenheit and increased white cells in her spinal fluid. She recovered completely in a few days.

Polio was suspected and a polio virus with very limited disease-causing ability for monkeys was isolated from the child's stools. But she did not develop increased amount of antibodies against poliomyelitis while she was recovering, as would be expected if she had had polio.

This was back in 1947, however. In 1952, scientists developed a new method of growing polio virus in tissue culture outside the body of a human or a monkey. Using this method with the Mack child's specimens which had been frozen and kept, the Louisville scientists found the new virus which they call Mack virus.

Mack virus is immunologically distinct from polio virus. It does not cause polio damage in monkeys. Antibodies that neutralize Mack virus were present in large amount in the child's blood during her recovery and they have been found in blood serum of adults and in a pool of human gamma globulin.

The virus might be a Coxsackie virus. Viruses of this group cause polio-like sickness. To determine the importance of the Mack virus as a cause of disease and the types of sickness it might produce would require further studies, the Louisville scientists point out in the *Proceedings of the Society for Experimental Biology and Medicine* (June).

Science News Letter, August 8, 1953

MEDICINE

Polio Nearing Peak as G.G. Evaluation Started

► **BY MID-AUGUST** the current polio epidemic may be at its peak. Health authorities hesitate to say the high point has been reached yet, even if there is a drop in reported cases during a week.

A drop in cases one week may be followed by a rise the next. This could be partly due to delayed reporting, or to actual changes in the course of the epidemic.

Meanwhile, an effort will be made to determine the results of the wide scale use of gamma globulin this summer. The research program to determine this was an-

nounced by Surgeon General Leonard A. Scheele of the Public Health Service, U. S. Department of Health, Education and Welfare.

No one will ever be able to say with certainty how many children escaped paralysis and crippling because they got gamma globulin this summer. That is because there were no controls, children who did not get gamma globulin, who could be used to make comparisons.

But the Public Health Service and co-operating agencies hope to get some idea by comparing the severity of paralysis in children within the same household where the first patient or two did not get g.g., and the later patient or patients did.

Mass prophylaxis by giving g.g. to all children in a community did not start until a certain number of cases had developed. So in those communities some comparisons could be made between the first cases and those developing after the children got g.g.

The plan is to have each patient in the study examined by a trained physical therapist from 50 to 70 days after the patient's illness started. Services of the physical therapists are being arranged by the American Physical Therapy Association aided by a grant from the National Foundation for Infantile Paralysis.

The Association of State and Territorial Health Officers and the D. T. Watson School of Physiatrics, affiliated with the University of Pittsburgh School of Medicine, also collaborating in the study.

Science News Letter, August 8, 1953

BOTANY

Plant Explorer Collects Seaweeds From Far East

► **AFTER THREE** months of dipping into exotic waters ranging from 39 degrees Fahrenheit near Hokkaido, Japan, to more than 100 degrees in the shallow Gulf of Siam, Dr. E. Yale Dawson has returned with a collection of 5,000 specimens of Far Eastern seaweeds, comprising about 500 species, many unknown to scientists.

Dr. Dawson, marine biologist with the Allan Hancock Foundation of the University of Southern California, spent most of this time collecting in the waters of Indo-China. Because of Communist guerrilla activities, he could search only in an area 20 miles on one side and five miles on the other of the Oceanographic Institute at Nhatrang.

Even so, Dr. Dawson gathered 240 species of seaweed from Indo-Chinese waters, several of them rare or undescribed. He is currently studying the Indo-Chinese collection microscopically, identifying and making illustrations of them. Herbarium specimens from the collection will be sent to museums the world over.

Seaweeds are widely used for food in the Far East. At one meal in Japan, Dr. Dawson had five kinds of seaweed—one in soup, two in salads and the others wrapped around fish and rice.

Science News Letter, August 8, 1953

IN SCIENCE

MEDICINE

Gamma Globulin Supply Will Last Polio Season

► **ALMOST ONE-HALF** of the nation's total pool of gamma globulin for polio fighting had been put out by the end of July. But children who have not yet gotten any, and their parents, need not worry.

The supply is expected to last out the polio season. One thing helping toward that is that allocation figures were worked out on the basis of number of polio cases in past years. Cases this year are running lower than last year.

Helpful also toward making the gamma globulin supply cover all needs is the fact that some communities given additional amounts for mass prophylaxis have returned some unused portions. Montgomery, Ala., for example, turned back a substantial amount.

The allocation for mass inoculations there was figured on the basis of all children under 13 years. But the local health authorities gave it only to children under 10 years, since the older age group was not being much hit by the epidemic.

Total amount of gamma globulin expected to have been available for polio fighting by the end of this year is figured at about 7,100,000 cubic centimeters. So far, about 3,000,000 cubic centimeters has been dispensed.

Cases are still mounting and health authorities do not expect the number to reach its peak before the second week in August.

Science News Letter, August 8, 1953

INVENTION

Better Weather Balloons Coated With Plasticizer

► **NEOPRENE WEATHER** balloons cannot climb as high in the sky at night as they can during the day because the plastic-like skin freezes at a lower altitude. Thus as the gas inside tries to expand, the neoprene balloon bursts and weather instruments plunge to the ground prematurely.

Eric Nelson of Madison, N.J., has received patent No. 2,646,370 on a method of making balloons that can soar at night as high as they can during the day. Mr. Nelson treats the neoprene film with a plasticizer after the balloon fabric has been fully cured and vulcanized.

The balloon is inflated and coated with a solution of dibutyl sebacate dissolved in ethyl alcohol. As the solution dries, the plasticizer is absorbed by the neoprene and thus becomes better fortified against cold. The patent was assigned to the Army.

Science News Letter, August 8, 1953

ICE FIELDS

GENERAL SCIENCE

Cosmic Ray Observatory Flown to 14,000 Feet

► A NEW observing station for gathering information on cosmic rays and atmospheric conditions in northern latitudes has been established on Mt. Wrangell, a 14,006-foot peak some 150 miles northeast of Anchorage.

So far over three dozen landings and take-offs on the summit have been made, Dr. Serge A. Korff, scientific leader of the expedition, reports. The station, a joint venture of New York University and the University of Alaska, is located only 200 feet from the peak of the dormant volcano.

The expedition is considering using the volcanic steam that issues constantly from vents near the top to heat its two Jamesway huts, one of which is used for housing and one as a laboratory.

All equipment and personnel have been landed by air, using a plane equipped with a ski-wheel combination landing gear. The supply flights were pioneered by Dr. Terris Moore, president of the University of Alaska, and Dr. Korff.

Observations made at the peak this summer are aimed at finding the connection, if any, between cosmic rays and other radiation bombarding the earth to produce the aurora borealis, radio static or magnetic storms.

Although the station is primarily for the study of cosmic rays, it is also available for other research. Meteorologists, biologists and physiologists are expected to make use of the research facilities when they require high altitudes, far northern latitudes and low temperatures for their studies.

Science News Letter, August 8, 1953

PHYSICS

Probe Air Above Geomagnetic Pole

► BALLOONS AND rockets are being used this summer to make high altitude observations of atmospheric pressure, temperature and density as well as to gather data on cosmic rays near the north geomagnetic pole.

An expedition, known as Project Mushroom, is being made on the Navy icebreaker, USS Staten Island, to northern Greenland. There scientists will attempt to measure cosmic ray intensity above the earth's atmosphere, using both Geiger counters and ionization chambers. These instruments will be carried in "Deacon" rockets, which will be launched from balloons at an altitude of approximately 70,000 feet.

The balloon-rocket technique, commonly referred to as Balloon Assisted Take-Off or Rockoon, was developed by Dr. James A. Van Allen, head of the State University of Iowa physics department. This method makes possible the reaching of high altitudes by small, relatively inexpensive rockets.

A small rocket is lifted to altitudes of 50,000 feet or higher by a 55-foot diameter Skyhook balloon, and at a fixed altitude or time the rocket is fired in an almost vertical direction.

With the aerodynamic drag of the lower altitudes eliminated, the rocket achieves an almost perfect vacuum ballistic trajectory. It can thus attain altitudes greatly in excess of those that could be reached from a sea-level firing of the same rocket.

The physicists will also attempt to measure atmospheric pressure, density and temperature at altitudes above 100,000 by means of balloon-launched rockets. Similar experiments have been conducted at White Sands, N. M., but not in the Arctic regions.

The trip is sponsored by the Office of Naval Research with the assistance of the Bureau of Aeronautics and the Naval Research Laboratory.

Science News Letter, August 8, 1953

ANTHROPOLOGY

Discover 68 Village Sites Of Extinct Seafood Eaters

► SIXTY-EIGHT PREHISTORIC village sites of an extinct Indian tribe that existed principally on seafood have been uncovered on lonely San Nicolas island, 55 miles off the California coast.

Dr. Clement Meighan and Hal Eberhart, University of California at Los Angeles anthropologists, recently completed a survey of the island.

At its peak the population may have been well over 1,000 persons on the 32-square mile island, extremely dense by aboriginal standards.

An abundance of marine animals insured an ample food supply. The Indians seemed to have lived well on a diet of abalone, meat from huge sea elephants, smaller sea lions and birds, all of which still exist in great numbers on the island. They made fish hooks and ornaments from the abalone shells.

Little if any plant food was included in the diet. Plant life was sparse on the island.

This group of Indians is known as the Nicolenos. It is thought that they originally came from Shoshone stock and settled on the island some time before 1000 A.D.

Disease apparently greatly reduced their numbers before the Spaniards came. All but a lone female survivor died in Spanish missions on the mainland. She had somehow been left behind when the Spaniards took the group to the missions and lived alone on the island for 18 years. In 1835 she was found and taken to Santa Barbara, where she died soon afterward.

Science News Letter, August 8, 1953

TECHNOLOGY

Press Gives 2,500-Ton Squeeze for Tube Shapes

► A NEW 2,500-ton hydraulic press and related equipment at U. S. Steel Corporation's tube plant, Gary, Ind., now is squeezing out unusual tube shapes that cannot be worked by conventional means because of their unbalanced design.

The press also can produce tubing from red-hot stainless steel billets of a quality that forbids piercing, an elementary step in tube-making. Molten glass lubricates the billets as they scrape through the unusually shaped dies.

The whole system solves a problem of long standing, a company spokesman said. Odd-shaped tubes that heretofore could not be produced satisfactorily by existing methods now can be made.

Tubes from one and one-half to six and one-quarter inches in outside diameter can be made on the equipment. A sheet of glass fiber is wrapped around the hot billet before it is rammed through the die. The glass melts and lubricates the die as the red-hot billet is pushed through by a water-and-compressed-air power system capable of exerting almost a ton and a half of force to the square inch.

Billets too small to be pierced instead are drilled in one end to provide the hole needed by the "plunger" of the giant machine which pushes them through the dies.

Science News Letter, August 8, 1953

ECOLOGY

Forest Clearings Retain Snow for Summer Days

► THIRSTY VALLEY land can have more water by proper cutting of forests on the snowcapped mountains around it. This is the conclusion from a seven-year investigation made by Prof. Joseph Kittredge, forest ecologist at the University of California Experiment Station, Berkeley.

Prof. Kittredge discovered that, by cutting openings in forests along the west slope of the Sierra Nevada mountains around the water-hungry San Joaquin valley, more snow remains longer through the summer to provide water for the valley's streams.

Reasoning that more snow is found in openings in a forest than under the crowns of the trees or in deforested areas, Prof. Kittredge measured snow retention in cleared areas from one to two times the height of the trees in width. He found that, if these cleared areas are made over a third of the forest acreage, storage of snow should be increased by more than five inches water equivalent, when an average of 15.7 inches water equivalent of snow falls.

Besides providing more water through the summer months, this planned cutting of mountain forest areas, by reducing rate of melting of the snow, may reduce spring-time flood crests, Prof. Kittredge said.

Science News Letter, August 8, 1953

TECHNOLOGY

King Tut's Black Treasure

The "sweet root," licorice, was part of the treasure found in the tomb of the boy king of Egypt, Tut-Ankh-Amen. Still a treasure, licorice is used today by the millions of pounds.

By HORACE LOFTIN

► THE FAMILIAR buzz of ringing picks and shovels, songs, complaints and laughter that hovers about archaeological diggings had stopped after feverish days of work. The accumulated rock and rubble of 3,000 years had been cleared away, exposing the entrance to the buried tomb.

Then, while the whole world waited eagerly for the news, a party of 22 scientists, led by British archaeological Lord Carnarvon and Howard Carter, broke into the sealed doorway to enter archaeology's greatest treasure chest, the tomb of King Tut-Ankh-Amen—King Tut, the boy ruler of ancient Egypt.

Newspaper readers gasped at the listing of the tomb's fabulous contents: gold, precious stones, amazingly beautiful works of art, the ruler's fine vestments, rare oils and ointments.

And among King Tut's treasures, the archaeologists discovered a generous store of an ancient root—licorice.

Today a modern King Tut might be happy to exchange all his gold and precious stones for a monopoly of this "sweet root." More than 40,000,000 pounds of dried licorice root are imported to the United States alone each year.

Once Used as Medicine

In Tut's time, licorice was used as a flavoring or sweetening agent, and for medicinal purposes. Today licorice root uses range from tobacco and candy ingredients to an agent for extinguishing raging petroleum fires.

Meanwhile, research scientists in the laboratories of such concerns as the MacAndrews & Forbes Company, Camden, N. J., largest processor of licorice and its by-products in America, are striking out to discover still other applications of this ancient root to modern living.

Licorice root is derived from a hardy green shrub, *Glycyrrhiza*, that thrives best on riverbanks and flooded fields of Mediterranean countries. Spain, Italy, Greece, Syria, and especially Turkey are major producers. Only the roots of the plant, which are gathered every third or fourth year, are of commercial importance.

The basic step in the production of licorice materials is the water extraction of the "licorice principle" from macerated root. Then from this licorice extract, several commercial forms of licorice can be made, the three principal ones being licorice powder,

licorice paste and crystals of ammoniated glycyrrhizin.

Over 90% of the licorice used—most of it as paste—in the United States is consumed in the processing of tobacco. The majority of cigarette brands and pipe mixtures have licorice in their blending formulas.

Cigarettes use licorice in relatively small amounts, while some plug tobacco may have up to 20% licorice content. Large quantities of both powdered licorice root and powdered extract are used in snuff production.

A great deal of licorice is used in the making of candy and other confections. Remember the black chewy licorice whips, the licorice shoestrings and jujubes? As a matter of fact, licorice does not have to be black. The licorice powder is a light brown, and artificially black coloring is often added to licorice candy just to humor the consumers' preconceptions of what licorice should look like.

Crystals of the sweet principle, glycyrrhizin, play an important part as a masker



ALMOST A MOUNTAIN—A high pile of baled licorice root is being scaled by these workmen. The United States alone uses 40,000,000 pounds of dried licorice root each year, which is imported from Turkey, Syria and other Mediterranean lands.

of disagreeable flavors and a base for pharmaceuticals. However, they have a much "pleasanter" job as a sweetening and foaming agent for beverages like root beer and birch beer.

After licorice is extracted from the macerated root, there is left behind as waste an enormous quantity of root fiber. What can be done with it?

Fires can be fought with it, for one thing. If aluminum sulphate and sodium bicarbonate are mixed with water, a thick foam results. If this froth could be made to hold up long enough, it could be sprayed on hard-to-extinguish fires, and it would quickly shut out the oxygen supply to halt combustion.

Used in Fire-Fighting Foam

If spent licorice root is boiled with caustic soda, the resulting extract—Foamite-Firefoam stabilizer—will do the job of making the foam tough, long-lasting and effective in fire-fighting. The mixture of aluminum sulphate, sodium bicarbonate and the stabilizer is marketed as Foamite-Firefoam powder by the American-LaFrance-Foamite Corp.

A more obvious use for the sturdy fibers of spent licorice root is for insulation board and boxboard. The Plastergon Wall Board Co. produces a strong, efficient insulation board from licorice root wastes which is highly effective against penetration of noise, heat and cold.

Pulp made from spent licorice root is combined with wood pulp, waste paper and other conventional materials to produce a superior boxboard for quality packaging.

Illustrating again the wide variety of uses discovered for spent licorice root is a mushroom compost. The spent root is fortified with chemical nutrients and is set aside, or composted, for about a month, during which time bacteria begin to break down the fibers into a form usable by mushrooms for growth. When the compost is ready, mushroom spawn is planted in it, producing a yield of plump, white mushrooms in a few weeks.

Ancient Licorice Lore

The lore of licorice is nearly as ancient as civilization in the East. Egyptian hieroglyphics described it as "medicine and elixir of life." The Shen nung Pen Ts'ao King, one of the earliest written medical records, spoke of licorice as a magical root that gives youth to the aged.

The prophet of the Hindus, Brahma, also recommended licorice as an "elixir." In China, a liquid extract of licorice root was poured over Buddha's statue on his birthday. The fluid that dripped from the statue was caught by eager pilgrims and used as a potent medicine.

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AERONAUTICS

Anti-Noise Program

► AN INTENSIVE "stop-that-racket" program has shifted into high gear within the aviation industry as aeronautical experts match wits with the airport headache, noise.

More powerful piston and jet engines with lustier accompanying sounds have prompted the anti-noise program.

The battle against sound is not limited to airports, however. Design and test engineers are working on the problem at the grassroots level. They hope to build more "hush" into future planes.

But noisy present-day planes can be made less irritating if operators use airports away from the city. In big cities, other measures sometimes are required.

In New York, for instance, the lessening of airport racket has been guided recently by a special group called the National Air Transport Coordinating Committee. This group, sponsored by 12 noise-conscious aviation organizations, has made several recommendations now being tried out there. They are:

1. Runways that lead out over water or industrial areas should be used as much as possible in preference to runways that force planes to fly over densely populated areas.
2. Instead of circling the airport while

gathering flying speed, pilots should climb to 1,200 feet as fast as they safely can. At this altitude, airplane noise is not so objectionable on the ground.

3. When necessary to "gun" airplane engines during maintenance ground checks, a site should be selected that is screened by airport buildings. Buildings help muffle engine noise.

The Aircraft Industries Association reports "credible progress" has been made as a result of the NATCC's recommendations.

The "stop-that-fuss" program even reaches into the nation's scientific laboratories. Currently the National Advisory Committee for Aeronautics is working on some aspects of the problem. Aircraft builders are doing the same.

The NACA, a research organization, recently published a technical bulletin covering its studies of transport plane propeller noise. Summarizing the findings, NACA scientist Harvey H. Hubbard wrote:

"For future propeller aircraft, the adherence to current design trends will probably not be feasible if noise reductions are to be obtained, or even if present levels are to be maintained."

The NACA study showed propeller noise was cut down as the speed of the propeller tip was reduced. Ideally, new planes should have more propeller blades spinning at slower speeds.

Ideally, also, the planes should have better engine exhaust mufflers. But as always, aeronautical engineers must compromise the "ideal" aspects of plane design to efficiency and weight limitations.

A panacea that will eliminate all noise around airports probably can never be pulled from a hat. But with scientists attacking the problem from every angle, it is likely that the whine, throb and roar of airplanes will be diminished in the future.

Science News Letter, August 8, 1953

The armies of Alexander the Great and the conquering Caesars carried stores of licorice root with them for food and medicine. Early Greek physicians prescribed licorice for asthma and maladies of the chest. Licorice with honey was thought good for wounds.

In the Dark Ages, the "secrets" of licorice were kept alive in the monasteries of southern Europe, to become popular again during the Renaissance.

The usefulness of the "sweet root" has been known to mankind throughout the ages. But none of King Tut's priests, none of the learned Greeks, nor any of the medieval alchemists could ever have dreamed of the astounding ranges of uses modern man has found for this versatile root, licorice.

SCIENCE SERVICE has prepared a kit containing specimens of licorice root, licorice powder and paste, and crystals of glycyrrhizin. There are also samples of Foamite-Firefoam powder, insulation board and box-board to illustrate licorice by-products. A booklet accompanying the kit describes experiments that can be performed to test the qualities of licorice.

These kits are available for the science-minded at 75 cents each from SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C. When making a request, ask for the Licorice kit.

Science News Letter, August 8, 1953

ELECTRONICS

Wrist Radios—Maybe

► COMMERCIAL PRODUCTION of Dick Tracy wrist radios some day may be made possible by the tiny electrical wonder, the transistor. However, vest-pocket television sets seem improbable.

Transistors are corn-kernel chunks of a rare metal, germanium. They can do some of the jobs of big tubes such as are in your home radio. In addition to their compactness, transistors are rugged and long-lived under ideal conditions.

Two engineers working for a large electrical equipment manufacturer fabricated an experimental wrist-sized radio using transistors. The radio was one and a half inches long, two inches wide and three-fourths of an inch thick. Its antenna is worn inside the coat.

Another company produced an experimental, transistorized portable television set that could be carried to the beach. But considering the complexities of television picture tubes, it seems unlikely that anyone will create a vest-pocket video set in the future.

Although plagued by the "bugs" that usually go along with new things, transistor research rapidly is revealing effective "bug-exterminating" methods.

However, imperfect as it is, today's transistor can perform certain non-critical jobs, although transistors are not yet sufficiently

standardized in performance to be interchangeable in critical radar and television circuits.

Transistors, because of their small size, promise to permit great shrinkage in some electronic equipment. Following the trend toward smallness, manufacturers of electronic circuit parts are turning out baby coils, condensers and resistors.

Electronic experts who design military equipment are keeping sharp eyes focused upon transistors. If the tiny devices can be substituted for some of the regular vacuum tubes, radar sets and gun-aiming devices can be made smaller, lighter, more rugged and perhaps more reliable.

Transistors, however, are finicky temperature-wise. They do not work properly when hot. When mixed with regular vacuum tubes, which produce great heat in confined quarters, transistors frequently fail unless pampered by refrigeration.

Scientists, though, are working at these problems. They are learning to seal transistors hermetically against the damaging effect of high humidity. They are studying ways to fortify the devices against heat. They are trying to standardize the performance of similar units.

Future refinements of the electronic infant promise it a bright future, and promise Americans new "miracles" in electronics.

Science News Letter, August 8, 1953

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• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ANTIBIOTIC THERAPY—Henry Welch and Charles N. Lewis—*Medical Encyclopedia*, 562 p., illus., \$10.00. Telling something of the history of the development of this new class of remedies and of the men who discovered them, and summarizing their uses and side effects.

AVIATION TOXICOLOGY: An Introduction to the Subject and a Handbook of Data—Committee on Aviation Toxicology, Aero Medical Association—*Blakiston*, 120 p., \$4.00. Containing information regarding the concentrations tolerated in the confinement of airplanes and descriptions of the physiological effects.

DIALOGUE ON THE GREAT WORLD SYSTEMS: In the Salusbury Translation—Galileo Galilei, edited by Giorgio de Santillana—*Univ. of Chicago Press*, 506 p., illus., \$12.50. This is the first new translation, in nearly 300 years, of Galileo's great philosophical work, one for which Galileo was imprisoned by the Inquisition because he stated that the earth moves around the sun.

ENDOCRINOLOGY IN CLINICAL PRACTICE—Gilbert S. Gordan and H. Lissner, Eds.—*Year Book Publishers*, 407 p., illus., \$10.50. To furnish to the practicing physician a digest of the material he needs for diagnosis and treatment of endocrine disorders.

A FORGOTTEN KINGDOM: Being a Record of the Results Obtained from the Excavation of Two Mounds Atchana and Al Mina, in the Turkish Hatay—Sir Leonard Woolley—*Penguin*, 191 p., illus., paper, 75 cents. First published report on seven seasons of digging that have made it possible to trace cultural connections between the Middle East and the Aegean.

GENERAL EDUCATION BOARD ANNUAL REPORT 1952—*General Education Board*, 86 p., illus., paper, free upon request directly to the publisher, 49 West 49th Street, New York, N. Y. This foundation appropriated \$4,804,939 in 1952 and, except for administrative expenses, all of it went to advance higher education in the southern states.

GMELIN'S HANDBUCH DER ANORGANISCHEN CHEMIE: System Nummer 9, Schwefel Teil A, Lieferung 2—Gmelin Institut—*Verlag Chemie (Walter J. Johnson)*, 450 p., paper, \$35.30. This volume of the classical German reference work on inorganic chemistry contains a review and critical analysis of our knowledge of sulfur and sulfur compounds.

GMELIN'S HANDBUCH DER ANORGANISCHEN CHEMIE: System Nummer 9 Schwefel, Teil B, Lieferung 1—Gmelin Institut—*Verlag Chemie (Walter J. Johnson)*, 372 p., paper, \$29.40. This volume covers the compounds of sulfur, the sulfur hydrides and oxides.

HEALTH AND HUMAN RELATIONS: Report of a Conference on Health and Human Relations Held at Hiddesen near Detmold, Germany, August 2-7, 1951—Sponsored by The Josiah Macy, Jr., Foundation—*Blakiston*, 192 p., \$4.00. Emphasis of the conference was on the importance of human relations in insuring mental health, and special attention was given to the problems of post-war Germany. Reports of

previous conferences in the U. S. are available from the Josiah Macy, Jr., Foundation.

HOMO SAPIENS AUDUBONIENSIS: A Tribute to Walter Van Dyke Bingham—Walter Van Dyke Bingham and Millicent Todd Bingham—*National Audubon Society*, 39 p., illus., \$1.10. Published in honor of the memory of the psychologist, Dr. Bingham, this slim volume contains his own analysis of the traits of a naturalist as well as a character study of him by his wife.

HOUSING AND BUILDING IN HOT-HUMID AND HOT-DRY CLIMATES—W. R. Woolrich, Conference Chairman—*Building Research Advisory Board*, Research Conference Report No. 5, 177 p., illus., paper, \$6.00. Within the United States, 30 to 40 million people of the blond races have learned to live energetic lives near the equator. The problem of building comfortable homes and work places for them is discussed.

INTERNATIONAL HEALTH ORGANIZATIONS AND THEIR WORK—Neville M. Goodman—*Blakiston*, 327 p., \$6.50. Describing the attempts of governments to work together to solve health problems, from the first quarantine meetings in 1851 to the Third World Health Assembly in 1950.

MARRIAGE AND THE FAMILY IN AMERICAN CULTURE—Andrew G. Truxal and Francis E. Merrill—*Prentice-Hall*, Rev. ed., 587 p., \$7.65. This edition has been revised to include a new section on the preliminaries to marriage and another on marital relationships.

MODERN HOME MEDICAL ADVISER: Your Health and How to Preserve It—Morris Fishbein, Ed.—*Garden City*, rev. ed., 902 p., illus., \$4.95. Prepared by 25 specialists, this answers the questions that arise in every family about the human body and its ills.

A NEW AND PRIMITIVE EARLY OLIGOCENE HORSE FROM TRANS-PECOS, TEXAS—Paul O. McGrew—*Chicago Natural History Museum*, 5 p., illus., paper, 15 cents. Description of a new and very interesting form.

NEW BIOLOGY 14—M. L. Johnson and Michael Abercrombie, Eds.—*Penguin*, 128 p., illus., paper, 50 cents. One of the articles in this volume makes the suggestion that instead of saying of fighting people that they "live like cat and dog," we should say they "live like cock robins in the spring."

PHILHARMONIC: A Future for the Symphony Orchestra—Thomas Russell—*Penguin*, 208 p., paper, 50 cents. A book about symphony orchestras by a man who has played in them and has managed one of them, The London Philharmonic. He has a faith in the capacity of the "man in the street" to appreciate the best in music.

PLANTS OF ROCKY MOUNTAIN NATIONAL PARK—Ruth Ashton Nelson—*Govt. Printing Office*, 201 p., illus., paper, \$1.00. All lovers of flowers will take delight in this beautifully illustrated book. Visitors to the park, particularly, will

appreciate its aid in identifying the flowers they see there.

PROCEEDINGS OF NATIONAL FOOD AND NUTRITION INSTITUTE—Staff, Bureau of Human Nutrition and Home Economics—*Govt. Printing Office*, Agriculture Handbook No. 56, 161 p., illus., paper, 65 cents. The institute was organized to make possible a sort of stock-taking on the national food supply and discussion of food problems throughout the nation.

RIVER BASIN SURVEYS PAPERS: Inter-Agency Archaeological Salvage Program Numbers 1-6—Frank H. H. Roberts, Jr. and others—*Govt. Printing Office*, 336 p., illus., paper, \$1.75. Reports of what has been done to salvage archaeological treasures in advance of the flooding waters.

SUGGESTIONS ON THE ORGANIZING OF INTERNATIONAL CONGRESSES—*Council for International Organizations of Medical Sciences*, 31 p., paper, 40 cents. Very helpful hints for those planning international meetings. Appendices furnish guidance to authors of papers and models for rules governing subventions.

SUMMER COMFORT—Small Homes Council—*University of Illinois*, Bulletin, Volume 50, Number 79, 8 p., illus., paper, 10 cents. Timely hints on how to keep your house cool on these scorching days. (See p. 85.)

WORD PERCEPTION AND RECOGNITION—Emmett Albert Betts—*Reading Clinic, Temple University*, 8 p., paper, 50 cents. Discussing the mental processes involved in the perception and later recognition of printed words.

YOU AND SPACE NEIGHBORS—John Lewellen—*Children's Press*, 58 p., illus., \$1.50. To acquaint young people with the universe, which is not really as small and available to travel as the television might make it seem.

Science News Letter, August 8, 1953

TECHNOLOGY

Threaded Nail Superior For Fastening Flooring

► A FLOORING nail with a threaded shank has proved that it is highly superior to ordinary flooring nails, and to "cut-nails" with square-shaped shanks.

The threaded nail is lighter and cheaper than cut nails, drives into the wood with less effort, cuts the danger of splitting the flooring during nailing, assures tighter fastening and eliminates loose, squeaky, springy or buckled flooring under normal service conditions.

Dr. E. George Stern, director of the Virginia Polytechnic Institute Wood Research Laboratory, Blacksburg, found in year-long tests that the threaded nail was 53% to 570% more efficient than plain-shanked brads, and 15% to 301% more efficient than cut nails.

The threaded fastener was tested under rigorous conditions in wood samples that were systematically soaked in water, then dried to various degrees.

Science News Letter, August 8, 1953

If a cure can be found for atomic defects of metal crystals, it may be possible to increase some metal strengths 1,000 times.

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GENERAL SCIENCE

Atomic Power Materials

Unusual substances, among them combinations of ceramics and metals known as cermets, are being tested both as moderators and shields for atomic furnaces.

► **MATERIALS MUST** withstand extraordinary temperatures, unusual corrosion and the battering of atomic radiation in order to be useful in atomic power developments.

Unusual ceramic materials are finding a use in the Atomic Energy Commission program, it is revealed in the Fourteenth Semiannual Report of the Commission. Many of these new materials with unusual properties are ceramics, in the same class as bricks, dinnerware and glass.

From the time of the first atomic furnace or reactor some materials such as graphite, beryllium oxide and portland cement have been used both to moderate the power-giving chain fissioning of uranium or plutonium, and to shield against the powerful radiations developed.

Materials that have been rare heretofore are being used in many cases. There is a large program under way for the production of zirconium and hafnium because of their usefulness in the Atomic Energy Commission program.

Zirconium was until recently a little used and little known metal, yet the Atomic Energy Commission is going to buy 375 tons of this metal during the next five years at a cost of \$13.46 per pound. Research is underway on zirconium as well as on titanium, vanadium, thorium and niobium as Atomic Energy Commission materials.

At the Oak Ridge National Laboratories combinations of ceramic materials and metals, called cermets, are being studied intensively. There and at Argonne laboratories and Battelle Memorial Institute there are explorations into the properties of the number of oxides, nitrides, borides and carbides for use in reactor construction.

An attempt is being made to develop a new kind of stainless steel alloy that can be used under very corrosive conditions at high temperatures. There is already one stainless steel that is suitable for high pressures but not at high temperatures under corrosive conditions.

There is another steel that stands up under severe corrosion but not at high pressures. An attempt is being made to develop a welding alloy that will have the best qualities of both of these stainless steels.

One of the first successful methods for applying a ceramic coating to commercial nickel has been announced by Oak Ridge National Laboratory, Oak Ridge, Tenn., operated by Union Carbide for the Atomic Energy Commission.

Nickel is one of the refractory metals, possessing excellent heat conducting characteristics, but it is limited in its use at high temperatures because of its poor resist-

ance to oxidation. The new coating process may permit the use of nickel in jet engines, gas turbines, guided missiles and other high-temperature devices.

The coating method, developed by a group headed by G. D. White, consists in annealing nickel specimens in water-saturated hydrogen at a temperature of 1,000 degrees Fahrenheit. The specimens are then sprayed with National Bureau of Standards ceramic coating A-418, dried and fired.

The durability of the coating was tested by heating the specimens in an oxidizing atmosphere at 1,500 degrees Fahrenheit for 65 hours. At the end of the test, the specimens still had a good appearance and showed improved adherence of the coating. The advantage of using wet hydrogen over dry hydrogen in the annealing process is shown by the durability of the coating at elevated temperatures obtained with wet-hydrogen-annealed nickel, compared with the bubbly surface condition produced on specimens that had been annealed in an atmosphere of dry hydrogen before coating.

Science News Letter, August 8, 1953

ELECTRONICS

Fast-Flipping Switch Helps "Brain" Memory

► A FAST-FLIPPING silicon switch has been developed that keeps electronic "brains" from getting amnesia.

Officially called "silicon alloy junction diodes" by Bell Telephone Laboratories engineers who developed them, the switches permit electricity to flow only in one direction.

If the current tries to move in the opposite direction, the match-head-size devices throw up great resistance. Measurements show that current leaking backward through ordinary vacuum tube rectifiers can be a thousand times greater than the amount that can get past the sturdy resistance of the silicon alloy diodes.

By passing a tiny charge of electricity to the plates of a condenser, the tiny switch permits complex electronic "brains" to store one bit of information. By keeping the charge from leaking off the condenser, the diodes prevent the brains from forgetting.

An outgrowth of transistor research, the junction diode works thousands of times faster than its best mechanical counterparts. It requires no filament, therefore needs no warm-up time before working properly. It can withstand high temperatures. Engineers predict its lifespan "should be almost unlimited."

Science News Letter, August 8, 1953

SENSATIONAL OPTICAL BARGAINS



A BRAND NEW IDEAL COMBINATION BOX MICROSCOPE AND 10X TELESCOPE

Amazingly practical and useful. Carry it right in your pocket—has convenient holding clip. The 50 power microscope is easily focused by tilting slightly. Achromatic objective lens. Used for any close-up examination or inspection. Just remove metal cap and draw out sliding tube for focusing telescope. An imported instrument at a bargain price. Chrome and black finish. Length closed 5"—dia. 1 1/16". Stock No. 30,059-Q.....\$4.50 Postpaid

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IMPORTED MICROSCOPES

100, 200, 300 POWER

ONLY \$14.95 Postpaid
1 Ocular
3 Objective Lenses.
Rack & Pinion Focusing.



Good optical qualities. Fine focusing. Certainly not the equal of a \$200 instrument—but definition is surprisingly clear and good. In fact amazingly so at this price. Revolving disc-light, adjustable mirror. Square Stage (2 1/4" x 2 1/4") with slide clamps. Serviceable construction. The greatest microscope bargain on the market! TRY IT FOR 10 DAYS... if you're not completely satisfied your money will be refunded in full. Instrument comes packed in sturdy, hardwood case. Stock No. 70,008-Q.....\$14.95 Postpaid

PREPARED MICROSCOPE SLIDE SETS
10 Slides in Set—Standard Size Per Set
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Stock No. 40,007-Q Animals.....\$2.50 P.P.
Stock No. 40,008-Q Micro-Organisms.....\$3.00 P.P.



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Adjustable 20, 40, 60 POWER!
A compact, imported, handy precision instrument of many uses. Select power you want, then focus sharply by turning special micro-focus ring. Good quality optics. Full satisfaction guaranteed. Stock #30005-Q.....Only \$3.95 Postpaid



DIFFRACTION SPECTROSCOPE

Uses grating replica instead of prisms. Enables you to see what your photographic filters do... to see color characteristics of your photo light sources. You can attach to your camera for taking spectrograms. A wonderfully useful and practical instrument. Imported from England. A real bargain. Stock No. 50,020-Q.....\$14.70 Postpaid

IMPORTED 30 POWER TELESCOPE

Complete With Tripod Unusual Bargain Price

Excellent for amateur astronomers. All metal body—focuses from approx. 40 ft. to infinity. Achromatic objective—40 mm. dia.—outside surface low reflection coated. Smooth slide focusing eyepiece. Eyelens outside surface coated. Lens erecting system. Images right side up. Sturdy tripod 8 1/4" high. Can be used also for camera. Max. length 26 1/4". Barrel diam. approx. 1 1/4". Weight 1 1/4 lbs. Stock No. 70,018-Q.....Only \$21.95 Postpaid

IMPORTED BABY MICROSCOPE

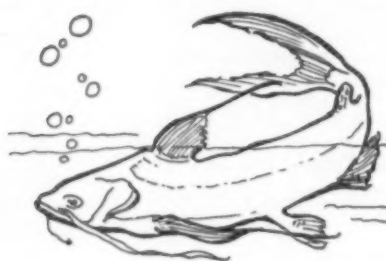
50 Power—Only 5" High

A little gem, gives astoundingly sharp definition! Good optical qualities, hinged base for inclined easy viewing, easy-to-use pinion focusing. Circ. stage, revolving disc-light mirror. Stock No. 50,000-Q.....\$4.00 Postpaid

SIMPLE LENS KITS! Kits include plainly written illustrated booklet showing how you can build lots of optical items. Use these lenses in experimental optics. Building TELESCOPES, low power microscopes, etc. Stock #2-Q—10 lenses.....\$1.00 Postpaid
Stock #5-Q—45 lenses.....\$5.00 Postpaid
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Awaiting Accolade

► **CATFISH!** THE word is usually spoken scornfully, as of an inferior creature, little better than the worm he gulps for bait.

Admittedly, things are against the catfish socially. He hasn't much for looks, or grace, or agility, or fighting spirit, like the patrician trout, the lordly bass, or even the robber-baron pike.

He seems quite content to dwell in the muddy slums of the aquatic world, snout-ing in the bottom slime for food and willing to eat almost anything. Only the carp will consent to live in worse quarters than a catfish will put up with. He is the pig among fishes.

That porcine metaphor, however, contains the catfish's vindication as well as his condemnation. For the pig, too, is un-beautiful, delights in mud, gobbles garbage, yet becomes most excellent eating when properly dressed and cooked. And just as the pig achieves a degree of splendor in the big wild boar, there is a catfish that comes very near to nobility—the big channel cat of the larger Midwestern rivers.

In that part of the country, at least, people have learned to appreciate the catfish that comes very near to nobility. A really properly fried catfish can taste mighty good. They have made a virtue of necessity, for their rivers yield no trout, and you may have to drive for scores of miles to find even fair bass or pickerel fishing.

Similarly in the South, the catfish becomes a tasty dish in the hands of a cook who really knows his subject.

Science News Letter, August 8, 1953

• RADIO

Saturday, August 15, 1953, 3:15-3:30 p.m., EDT
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Lawrence R. Hafstad, director of reactor development, Atomic Energy Commission, discusses "Atomic Furnaces."

An average of more than 500 forest fires a day was reported during 1952.

STATISTICS

Previous Marital Status

On basis of figures available from 14 states, statisticians find that only one out of five of those who marry have previously been married.

► **FOUR OUT** of five of those who marry have not been married before.

While nation-wide figures on previous marital status of brides and grooms are lacking, Metropolitan Life Insurance Co. statisticians have compiled the information for 1950 for 14 states for which information is available.

The relative importance of first and later marriages varies widely according to age. Among those marrying in 1950 at ages under 25, bachelors and spinsters constituted well over 90% of the total. However, the proportion decreased rapidly with advance in age.

For brides, only one-half of those at ages 30 to 34 entered their first marriage; at ages 45 to 49, the fraction was one-fifth; and at ages past 60, it was less than one-tenth.

The proportions were about the same for bachelors five years later in life—reflecting the somewhat older age at marriage for men than for women. Thus bachelors constituted one-half of the grooms at ages 35 to 39, and almost one-fifth at age 50 to 54.

Among the men and women who married in 1950 at ages 25 or older, a considerable proportion had already been divorced. One-quarter of all the brides at ages 25 to 29 were divorcees, and the proportion rose to a maximum of nearly one-half in the age range 35 to 44 years.

Of the brides in their early 50's, divorcees represented about a third. For grooms, the proportion previously divorced increased from one-eighth for those marrying at ages 25 to 29, to a maximum of one-half for those marrying at 40 to 49.

With advancing age, the widowed increased in relative importance among those marrying. For example, widows constituted one-quarter of the brides at ages 40 to 44, one-half at 50 to 54, and more than four-fifths at ages 65 and over. However, because marriages at the later ages make up only a small fraction of the total, the widowed accounted for only about 6% of all brides and grooms in 1950.

Individual states differ markedly in the proportions of the single, divorced and widowed among those getting married. The proportion of brides who married for the first time in 1950 ranged from a little more than 85% in Massachusetts and New York to somewhat less than 65% in Florida and Wyoming. These figures are inversely related to those for the divorced; the proportions of divorcees among women getting married ranged from 8.6% in New York to 28.3% in Wyoming. In every state, widows constituted the smallest group among those marrying.

These geographic variations reflect a number of factors, including the age and marital composition of the population, differences in attitudes toward divorce among various religious groups and, even more important, the diversity in our marriage and divorce laws.

Thus the high proportion of bachelors and spinsters among persons marrying in Massachusetts and New York reflects in part the tendency of many of their divorced residents to remarry in other states.

Such a movement from Massachusetts accounts in large measure for the relatively high proportion of divorced among the brides and grooms in New Hampshire. Similarly, many New Yorkers, as well as persons from other states, obtain their divorce in Florida and remarry there before returning home.

Science News Letter, August 8, 1953

ENGINEERING

Production Engineering Used in "Front Office"

► **THE METHODS** of the production engineer, whose time and motion studies revolutionized the manufacturing end of industry, are now being felt in the "front office" and sales departments.

Dr. Joseph Carrabino, a production management expert at the University of California at Los Angeles, has designed work simplification programs for such diverse enterprises as hospitals, banks, department stores and factories.

"Only recently has management come to realize that running an office or sales division is not much different than running a factory assembly line," Dr. Carrabino explained.

One of the nation's largest insurance companies now has a whole department devoted to simplifying its paper work and other operations. A large chain of banks has achieved huge savings by treating its paper work as a materials handling problem, which it is. A refining company recently used tools developed by the industrial engineer to increase its sales by 15% while reducing its sales force 38%.

"For years now," says Dr. Carrabino, "anyone wanting to cut down on the cost of his product has looked first to the production line. We are just beginning to take a new look at mounting distribution costs which have risen until they are now higher than the cost of manufacturing the product."

Science News Letter, August 8, 1953



HIGHER FIREPOWER—Shown here is the firing test of the Navy's new three-inch, rapid-fire anti-aircraft gun that can fire proximity-fused ammunition much faster than those used in World War II.

PUBLIC HEALTH

Radiation Gives Safe Pork

Trichina worms in larval stage are prevented from maturing, and thus reproducing, by exposure to gamma rays from cobalt-60. No cure now known for trichinosis.

► **GAMMA RAYS** from radioactive cobalt-60, now used to combat cancer, may become the means for ending human infections of dangerous trichina worm parasites from infected pork products, two Michigan scientists have revealed.

The often lethal parasites are contracted by humans from eating infected raw or undercooked pork. But exposure of meat to 20,000 roentgens of irradiation from cobalt-60 will prevent any larval trichina worms present from maturing. This keeps them from growing and reproducing in humans eating infected pork, and so human infection is prevented.

Drs. H. J. Gomberg and S. E. Gould, working at the University of Michigan's Memorial-Phoenix Project, Ann Arbor, reported these findings in *Science* (July 17).

No specific cure for trichinosis is known, though the trichina parasite has been estimated to infect about 18% of the entire United States population. Treatment is only symptomatic and general.

Until the discovery of irradiation as a means of controlling the parasites, thorough cooking or quick-freezing at very low temperatures was about the only sure way

of preventing trichina infection from infected pork products. The U. S. Bureau of Animal Industry requires all uncooked pork products to be stored for 20 days at 15 degrees below zero Centigrade (zero degrees C. is freezing) to control trichina worms.

Without irradiation or quick-freezing, pork products should be cooked 15 minutes for each pound of meat to insure freedom from the parasites.

When infected meat is eaten, worm cysts in the meat are dissolved in digestive juices, and the worms are freed to mate. After mating, the male trichina worms die, but the females burrow into the intestinal tract where they give birth to from 1,000 to 10,000 larval worms each in about six weeks' time.

The microscopic larvae get into the blood and lymph systems of the host, and are carried throughout the body. Later they enter tissue, especially the diaphragm and inter-rib muscles and muscles of the neck, larynx, tongue and eye. In the muscles they form cysts, and can become quite painful, even leading to death in some cases.

The encysted worms can remain alive as

long as 10 to 20 years in a muscle. The worm's life cycle is completed when the muscle tissue is eaten by another animal, and the worms released by digestive juices.

Control of the trichina worm is a major problem of public health. The common reservoir of the disease is the pig, which often gets the parasite from eating uncooked garbage containing infected meat.

Science News Letter, August 8, 1953

TECHNOLOGY

Navy Antiaircraft Gun Spits Shells at Missiles

► **HIGH-SPEED ENEMY** airplanes and guided missiles will have a tough time getting through heavy flak to attack Navy ships in the near future.

Reason: A new antiaircraft gun has been developed that spits shell fragments into the sky much faster than the guns effectively used during World War II.

Two of the new guns are combined into a hard-hitting team. The pair fires 50-caliber shells equipped with proximity fuzes that wreak havoc when within target range. The guns also can blast surface targets.

Developed as a replacement for the old, manually operated, single, three-inch gun, the new guns feature automatic loading. They can be controlled electronically by the ship's radar and fire control system, or they can be aimed and fired independently from the gun captain's seat on the mount.

Rear Adm. M. F. Schoeffel, chief of the Navy's bureau of ordnance, reports the gun gives several times more firepower than the old guns.

The Navy awarded a \$62,000,000 production order to the Firestone Tire and Rubber Co., after the new gun recently passed rigid tests at the Navy's proving ground at Dahlgren, Va.

Science News Letter, August 8, 1953

Questions

ASTRONOMY—How many "shooting stars" will be visible per hour any clear night just now? p. 86.

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CHEMISTRY—How can aluminum be separated from common clay? p. 84.

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ELECTRONICS—What are the prospects for development of wrist radios? p. 91.

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ENGINEERING—What are some ways of keeping a house cool without air conditioning? p. 85.

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MEDICINE—When is the peak of the current polio epidemic expected? p. 88.

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Photographs: Cover, British Information Services; p. 83, Fremont Davis; p. 85, Chrysler Corporation; p. 86, Harvard College Observatory; p. 87, University of Indiana; p. 90, MacAndrews & Forbes Company; p. 95, Firestone Tire and Rubber Company; p. 96, Bakelite Company.

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 686. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **FELT-TIPPED PENS**, which have marked many a highway map, now can be obtained to serve industry, offices, homes, stores and schools. Using a special water-proof, non-smudging, instant-drying ink, the pen has four standard felt nibs that draw lines up to $\frac{1}{8}$ inch wide.

Science News Letter, August 8, 1953

❁ **BASE FOR** a model of an oil-drilling rig presents a dramatic cross-section of underground formations in "black gold" country. Layers of rock are finished in seven colors that glow brilliantly under ultraviolet light. This hand-made model is somewhat expensive, but it is ideally suited for classroom use. It can be bought separately or in combination with the model drilling rig.

Science News Letter, August 8, 1953

❁ **TUBE SQUEEZER** is a keyed attachment for toothpaste, shaving cream and other collapsible tubes. Attached to the tube, the device rolls up the tube from end to mouth as the paste is used, often cutting waste by one-third.

Science News Letter, August 8, 1953

❁ **PILLOW THAT** is said to cool sleepers on hot summer nights is blown up like a



balloon and is partly filled with ordinary tap water. Made of a vinyl plastic, the pillow has breathing holes that let "stomach sleepers" bury their faces in comfort, as shown in the photograph. Water in the pillow does not have to be changed.

Science News Letter, August 8, 1953

❁ **PLASTIC RAINCOAT** comes with more than 100,000 tiny pores that let sticky air out, giving the wearer more comfort. Nearly microscopic in size, the holes do not make the raincoat more vulnerable to tearing.

Science News Letter, August 8, 1953

❁ **HEAT-RESISTANT GLOVES** are made in only one size, but come in several plys that resist heat from 500 to 800 degrees Fahrenheit. Manufactured from a soft flexible leather, impregnated with insulating and refractory materials, the gloves are pliable, comfortable and long-wearing.

Science News Letter, August 8, 1953

❁ **LETTER-FILING AID** consists of 26 alphabetically marked, spring-held leaves mounted to lie nearly flat on a base. Correspondence is quickly inserted between the small leaves for alphabetical sorting before filing.

Science News Letter, August 8, 1953

❁ **CORD PULLS** for venetian blinds eliminate the clatter of wooden pulls against the slats when gusts of air sweep through the window. Said to be almost completely noiseless, the plastic pulls will not break when stepped on or caught in the window.

Science News Letter, August 8, 1953

A FEW MEMBERSHIPS ARE NOW AVAILABLE

in Things of science

A WONDERFUL GIFT . . . ANY TIME OF THE YEAR

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Do You Know?

The sea scallop is one of New England's major fishery resources.

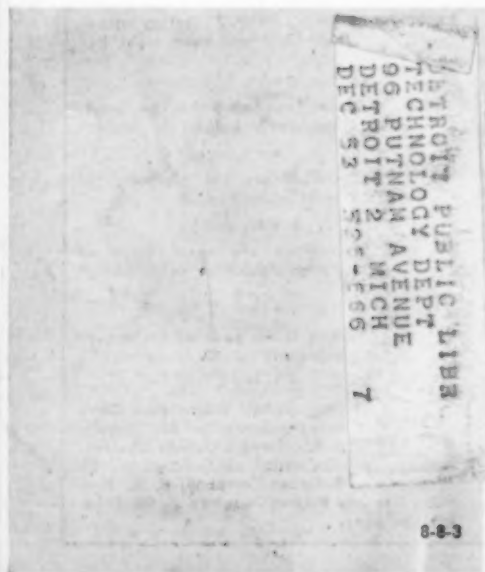
A "package" TV station for small communities is so built that one man can handle the entire station, including transmitter, slide and film projectors, audio and transcription facilities, and network programs.

Americans consumed three times as much chicken in 1952 as in 1940.

The protective dope covering used on the earliest fabric aircraft was sago, a starch often put in puddings.

Hydrazine is a clear, water-like liquid composed of nitrogen and hydrogen; the Germans put it to work during World War II as rocket fuel, although its existence had been known for 60 years.

If you live within 10 miles of the downtown area of a large city situated in a target area, you should build an A-bomb shelter for your family, the Federal Civil Defense Administration advises.



8-8-3